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NFPA 704

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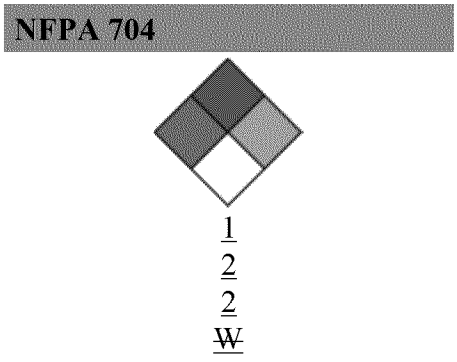

Fire diamond for Sodium borohydride

"NFPA 704: Standard System for the Identification of the Hazards of Materials for Emergency Response" is a standard maintained by the U.S.-based National Fire Protection Association. First "tentatively adopted as a guide" in 1960,[1] and revised several times since then, it defines the colloquial "**fire diamond**" used by emergency personnel to quickly and easily identify the risks posed by hazardous materials. This helps determine what, if any, special equipment should be used, procedures followed, or precautions taken during the initial stages of an emergency response.

Contents

Symbolism[edit]

The four divisions are typically color-coded, with blue indicating level of health hazard, red indicating flammability, yellow (chemical) reactivity, and white containing special codes for unique hazards. Each of health, flammability and reactivity is rated on a scale from 0 (no hazard) to 4 (severe risk). See the latest version of NFPA 704 sections 5, 6, 7 and 8 for the specifications of each classification.[2]

Health (Blue)		Flammability (Red)
0	Poses no health hazard, no precautions necessary and would offer no hazard beyond that of ordinary combustible materials (e.g., wood)	**0** Materials that will not burn under typical fire conditions (e.g., carbon dioxide), including intrinsically noncombustible materials such as concrete, stone and sand. (Materials that will not burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes.)
1	Exposure would cause irritation with only minor residual injury (e.g., acetone)	**1** Materials that require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur (e.g., mineral oil). Includes some finely divided suspended solids that do not require heating before ignition can occur. (Flash point at or above 93.4°C [200°F])
2	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g., diethyl ether)	**2** Must be moderately heated or exposed to relatively high ambient temperature before ignition can occur (e.g., diesel fuel) and some finely divided suspended solids that do not require heating before ignition can occur. Flash point between 38°C (100°F) and 93°C (200°F)
3	Short exposure could cause serious temporary or moderate residual injury (e.g., chlorine)	**3** Liquids and solids (including finely divided suspended solids) that can be ignited under almost all ambient temperature conditions (e.g., gasoline). Liquids having a flash point below 23°C (73°F) and having a boiling point at or above 38°C (100°F) or having a flash point between 23°C (73°F) and 38°C (100°F)
4	Very short exposure could cause death or major residual injury (e.g., hydrogen cyanide, phosphine, carbon monoxide, sarin)	Will rapidly or completely vaporize at normal atmospheric pressure and temperature, or is readily dispersed in air and will burn readily (e.g., acetylene, diethylzinc). Includes pyrophoric substances. Flash point below 23°C (73°F)
Special (White)		**Instability/Reactivity (Yellow)**

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The white "special notice" area can contain several symbols. The following symbols are defined by the NFPA 704 standard.

OX Oxidizer (e.g., potassium perchlorate, ammonium nitrate, hydrogen peroxide). Allows chemicals to burn without an air supply.

W Reacts with water in an unusual or dangerous manner (e.g., cesium, sodium, sulfuric acid)

SA Simple asphyxiant gas. Specifically limited to the following gases: nitrogen, helium, neon, argon, krypton and xenon.[2]

0 Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium)

1 Normally stable, but can become unstable at elevated temperatures and pressures (e.g. propene)

2 Undergoes violent chemical change at elevated temperatures and pressures, reacts violently with water, or may form explosive mixtures with water (e.g., white phosphorus, potassium, sodium)

3 Capable of detonation or explosive decomposition but requires a strong initiating source, must be heated under confinement before initiation, reacts explosively with water, or will detonate if severely shocked (e.g. ammonium nitrate, chlorine trifluoride)

4 Readily capable of detonation or explosive decomposition at normal temperatures and pressures (e.g., nitroglycerin, chlorine azide, chlorine dioxide)

Two plastic squirt bottles labeled with the NFPA 704 color code for hazardous materials identification. The ethyl alcohol (ethanol) bottle has an outdated health hazard of 0. It is now 2.

Non-standard symbols[edit]

These hazard symbols are not part of the NFPA 704 standard, but are occasionally used in an unofficial manner. The use of non-standard symbols or text may be permitted, required or disallowed by the authority having jurisdiction (e.g., fire department).

- **COR**: Corrosive; strong acid or base (e.g. sulfuric acid, potassium hydroxide)

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    - **ACID** and **ALK** to be more specific
- **BIO** or  : Biological hazard (e.g., smallpox virus)
- **POI**: Poisonous (e.g. Strychnine)
- **RAD** or  : Radioactive (e.g., plutonium, uranium)
- **CYL** or **CRYO**: Cryogenic (e.g. Liquid Nitrogen)

See also[edit]

- Globally Harmonized System of Classification and Labelling of Chemicals
- Hazard symbol
- HMIS Color Bar
- Hazchem
- Hazmat

References[edit]

1. ^ Proposed Amendments on Revisions to the Recommended System for the Identification of The Fire Hazards of Materials / NFPA No. 704M — 1969
2. ^ [a] [b] NFPA 704: Standard System for the Identification of the Hazards of Materials for Emergency Response, 2012 Edition

- 1910.1200 OSHA Hazard Communication
- University of Oregon Chem Labs - NFPA Hazard Identification System

External links[edit]

- NFPA 704 frequently asked questions
- Pamphlet produced by the City of Milwaukee summarizing NFPA 704 code requirements

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